

The VERTEX form of a Quadratic Function:

$$f(x) = a(x - h)^2 + k$$

(h, k) —————> VERTEX

a —————> Tells you the "width" and whether it opens upward or downward

$y = ax^2 + bx + c$ standard form

$y = a(x - h)^2 + k$ vertex form

Ex1: $y = 2(x - 3)^2 + 4$

- a) vertex: $(3, 4)$ a)
b) y-intercept: $(0, 22)$ b)
 $y = 2(0 - 3)^2 + 4 = 22$
c) axis of symmetry: $x = 3$ c)
d) vertex min or max.? d)
e) value of min. or max.? $f(3) = 4$ e)
f) pt. of symmetry: $(6, 22)$ f)
g) x-intercepts: g)

$$\begin{aligned} 0 &= 2(x - 3)^2 + 4 \\ -4 &= 2(x - 3)^2 \\ x - 3 &= \pm\sqrt{2} \end{aligned}$$

Ex2: $y = -3(x + 1)^2 - 2$

Ex3: $y=3x^2+6x-12$

$$y=3(x+1)^2-15$$

a) $(-1, -15)$

b) $(0, -12)$
c) $x = -1$

c) \min
d) $f(-1) = -15$

e) $(-2, -2)$

f) $(1+\sqrt{5}, 0)$ $(1-\sqrt{5}, 0)$

g) $y=3x^2+6x-12$

$$y=3(x^2+2x+1-4-1)$$

$$y=3(x+1)^2-5$$

$$y=3(x+1)^2-15$$

Ex4: $y=-2x^2+10x$

a)

b)

c)

d)

e)

f)

g)

Ex5: $f(x)=3x^2+7x+2$

a)

b)

c)

d)

e)

f)

g)